LATCHING MECHANISM FOR A MODULAR GUNSTOCK

CROSS-REFERENCE TO RELATED APPLICATIONS

This application is a continuation-in part application based on earlier filed application 10/180,429, filed on June 25, 2002, which is herein incorporated by reference.

FIELD OF INVENTION

The present invention relates to a latching mechanism for an adjustable rifle stock and more particularly to a cam-type latching mechanism structured for a modular gunstock that provides a constant surface for a uniform cheek weld and the option of a variable length feature.

BACKGROUND OF THE INVENTION

Adjustable gunstocks are known in the prior art. For example, U.S. Pat. No. 4,735,007 to Gal (1988); U.S. Pat. No. 4,327,626 to McQueen (1982); U.S. Pat No. 3,442,042 to Gilbert (1967); U.S. Pat. No. 3,348,328 to Roy (1966); U.S. Pat. No. 3,267,601 to Roy (1964); 3,137,958 to Lewis, et al. (1962); U.S. Pat No. 5,827,992 to Harris, et al. (1998) and U.S. Pat No. 2,900,877 to McClenahan (1956) are all illustrative of the prior art.

The current standard in automatic and semi-automatic rifles is to have a stock capable of receiving and covering a recoil absorption appendage, or "buffer tube", shown in the '992 and '877 patents. The most popular of the available adjustable stocks follow in form to the '328 patent, which is to say they use a spring loaded latch to bias a pin inside a provided adjustment hole. When a user wishes to adjust the stock, a simple compression of the spring/latch assembly is all that is required to release the pin and, therefore, adjust the stock. The '626 patent operates with a tooth-and-groove assembly which, otherwise, follows the same principles. In both cases, compression of the spring is necessary for adjustment in both directions along any length beyond the proximate hole/groove. All of the adjustable stocks may have their butt portion removed,

though they are not designed to have such a feature repeatedly used, much less have additional stock modules to exchange. In those cases where the stock moves longitudinally along the weapon, with no other motion relative to the weapon, the user must make some sacrifice as to one, if not both, of two features. The user either loses constant and uniform cheek weld to the weapon or stock stability. The lack of uniform cheek weld can interfere with comfortable and precise use of the weapon. Stock stability can also interfere with precise weapon use. The main cause of this sacrifice is the lack of a firm and reliable latching mechanism

While the aforementioned inventions accomplish their individual objectives, they do not describe a truly modular stock, namely a stock where the butt portion is designed to be changed at the whim or need of the user. The present invention is a cam/tension lock that enables the user to have not only a controlled extension, but also an unrestricted and silent compression and extension of a truly modular stock, as described in the parent application. None of the disclosed stocks have an adjustable preset lock to use in conjunction with an unrestricted adjustment. Finally, none of the disclosed stocks present a surface for a constant cheek weld while simultaneously having a sturdy, longitudinal adjustment capable stock, much less a uniform cheek weld with different stock types, still much less a latching system designed for such a modular stock system. In this respect, the latching system according to the present invention departs substantially from the usual designs in the prior art. In doing so, this invention provides more stable and strong latching mechanism for modular gunstock that allows for a uniform and identical cheek weld for different stock modules, even while simultaneously adjusting the stock length of an adjustable stock.

SUMMARY OF THE INVENTION

In view of the foregoing disadvantages inherent in the known types of gunstocks and their associated latching mechanisms, this invention provides an improved latching mechanism. As such, the present invention's general purpose is to provide a new and improved latching mechanism for a gunstock having multiple functionality, dependent upon chosen stock modules. The invention will provide simultaneous adjustment of the stock while providing a constant, uniform cheek weld on the stock when used with an adjustable stock module. The invention will also provide an identical cheek weld surface with a sturdy stock if a fixed stock is used.

To provide the improved features, the gunstock, as described and claimed in the parent application, comprises both a fore and butt portion. The fore portion consists of a buffer tube attachable to the weapon's receiver and a cheek plate extension essentially parallel to the buffer tube. Located on the underside of the buffer tube is a rail track. The rear portion consists of a receiving cylinder of sufficient length and width to receive the buffer tube of the fore portion. Located on the lower rim of the cylinder is the compression latching mechanism, designed to interface with the rail track. Rearward of the receiving cylinder is the stock butt and any other accessories as required by the user. In the preferred embodiment, the cheek plate is fused to the buffer tube, presenting a wider rest for a user's cheek, and the rear portion comprises a receiving cradle, or semi-cylinder, which interfaces along a pair of attachment grooves located on either side of the buffer tube, having a distal relation with the cheek plate. Interface detents are provided along lateral sides of the buffer tube for the purpose of interfacing with the latching mechanism

The latching mechanism according to this invention essentially comprises a cam type interface system. The mechanism is located within the rear portion of the gunstock and is

situated to interface with the buffer tube in the fore portion, specifically the rail track. In the preferred embodiment, the latching mechanism has a cam anchor situated so as to interface with the rail track and a bicuspid tooth, situated so that the cusps of the tooth are on either side of the cam anchor and so as to interface with the detents on the buffer tube in pairs. In so doing, the latching mechanism provides not one, as is the standard in the art, but three points of contact with the buffer tube, resulting in a firmer and more secure hold.

The more important features of the invention have thus been outlined in order that the more detailed description that follows may be better understood and in order that the present contribution to the art may better be appreciated. Additional features of the invention will be described hereinafter and will form the subject matter of the claims that follow.

Many objects of this invention will appear from the following description and appended claims, reference being made to the accompanying drawings forming a part of this specification wherein like reference characters designate corresponding parts in the several views.

Before explaining at least one embodiment of the invention in detail, it is to be understood that the invention is not limited in its application to the details of construction and the arrangements of the components set forth in the following description or illustrated in the drawings. The invention is capable of other embodiments and of being practiced and carried out in various ways. Also it is to be understood that the phraseology and terminology employed herein are for the purpose of description and should not be regarded as limiting.

As such, those skilled in the art will appreciate that the conception, upon which this disclosure is based, may readily be utilized as a basis for the designing of other structures, methods and systems for carrying out the several purposes of the present invention. It is

important, therefore, that the claims be regarded as including such equivalent constructions insofar as they do not depart from the spirit and scope of the present invention.

BRIEF DESCRIPTION OF THE DRAWINGS

Figure 1 is a side elevation of the latching mechanism according to the present invention.

Figures 2a-f display a blown-apart view of the latching mechanism.

Figure 2a is a side elevation of one half of a latch, detailing the latch's interior.

Figure 2b is a side elevation of the latching mechanism's actuator and cam anchor, from FIG. 2a.

Figure 2c is a side elevation of the latching mechanism's tooth and cam mechanism, from FIG 2a.

Figure 2d is a front elevation of the one half of a latch of FIG. 2a.

Figure 2e is a front elevation of the latching mechanism's actuator and cam anchor.

Figure 2f is a front elevation of the latching mechanism's tooth and cam mechanism.

Figures 3a-c are progressive side elevations showing the use of the latching mechanism with an adjustable stock.

Figure 4 is a side elevation of an adjustable stock module.

Figure 5 is a cross-section of the module of FIG. 4, taken along line 5.

Figure 6 is a bottom plan view of the modified buffer tube module.

Figure 7 is a side elevation of the modified buffer tube module.

Figure 8 is a cross section of the buffer tube module of FIG. 7 taken at line 8.

Figures 9a-c are partial cross sections of the latching mechanism and stock of FIGS. 3a-c respectively.

Figure 10 is a bottom plan view of the buffer tube module and associated preset system.

Figure 11 is a cross-section of the buffer tube module of FIG. 11, with the preset clip removed, taken along line 11.

Figure 12 is two close-up views of the preset tooth.

DETAILED DESCRIPTION OF THE PREFERRED EMBODIMENT

With reference now to the drawings, the preferred embodiment of the modular gunstock will be explained.

With reference to FIGS. 1, 2a-f the latching mechanism 20 incorporates a latch body 22, divided in two halves, a bicuspid latch tooth 28 and an associated cam mechanism 26. A safety latch 24 attached to a spring mount 25 with a safety tooth 27 may be incorporated, as shown in FIG. 1. Latch 20 is axially mounted about two mounting holes 34, one half of latch body 22 in each hole 34, in a manner to interface with rail track 8 and tooth interfaces 5, shown in FIGS. 3 and 4.

Latch 20 has three settings, shown in FIGS. 3 and 9, which activate cam mechanism 26 to bias tooth 28 against tooth interface 5. Latch body 22a is pulled backwards to disengage latch tooth 28 from tooth interfaces 5. This setting allows free adjustment, forwards and backwards, of the module. In the second setting, cam mechanism 26 operates to bias latch tooth 28 into a middle, ratcheting position. The latch tooth has a forwards-facing angle 30, which allows latch tooth 28 to catch the rail track if the stock module is pushed forwards, but disengages from tooth interfaces 5 for backwards extension. The final position is a locked position which forces latch tooth 28 into an almost vertical position. Cam anchor 32 is also forced into rail track groove 6. Safety latch 24 is forced to interface with the stock module with its safety tooth 27 by spring mount 25. The interface prevents latch body 22 from being compressed accidentally. Spring mount 25 is embedded into latch body 22 in such a manner that when safety latch 24 is mounted

upon it, safety latch 24 is flush with latch body 22. As tooth 28 is further biased against interface 5, stock module 12 is locked into relative position against the buffer tube module 2. This construction allows a three point locking system that gives more security and stability than the prior art single point locking systems. As such, the latching mechanism may be utilized in fixed stock modules. In FIGS. 3 and 9, 22a depicts a locked setting; 22b depicts an extension only setting; and 22c depicts a free motion setting. In all embodiments, rails 18 are slid through tracks 9 for proper guidance and hold.

The gunstock is composed of a modified buffer tube module 2 and a stock module 12. Buffer tube 2 fits on rifle 1 by replacing the existing buffer tube of the rifle with the buffer tube module 2. In addition, referencing FIGS. 3 and 4, rail track 8, with individual lateral grooves 6 and single transverse groove 7, is disposed towards the ground and cheek mount 10 is disposed upwards and is generally parallel to buffer tube 4. Two longitudinal tracks 9 are disposed slightly underneath cheek plate 10 providing attachment tracks for stock module 12. Ideally, the cheek plate 10 is fused onto the buffer tube 2. However, in alternative embodiments, enough space can be left between buffer tube 4 and cheek plate 10 to allow for unhindered motion of a cylindrical stock module. Tooth interfaces 5 are disposed underneath the longitudinal tracks 9.

Referring to FIGS. 6 and 7, stock module 12 has a receiving cradle 14 that fits over buffer tube module 2. Two attachment rails 18 are disposed at the upper two edges of the cradle 14. Behind receiving cradle 14 is the butt 16 of the stock. Butt 16 may be modified in various configurations, depending on the needs of the user. In the adjustable embodiment shown in FIG. 1a, latching mechanism 20 interfaces with rail track 8 via a bicusped tooth 28 and cam anchor 32.

In an alternate embodiment, shown in FIGS. 10, 11, and 12, a catch tooth 50 is disposed above the latching mechanism to interface with transverse channel 57. Catch tooth 50 is mounted upon catch base 52, forming a shape reminiscent of a capital "T", and is biased by spring 54 into a central position. Stop bar 56 is a clip insertable into the lateral grooves 55 of transverse channel 57. Stop bar 56 has a groove 59 corresponding with transverse channel 57 except that groove 59 is almost dissected by projection 58, leaving enough room for tooth 50 to pass through if biased to one side. In so doing, a preset function is added to this embodiment. A user simply inserts a stop bar at a desired length. When extending the stock module, tooth 50 will be blocked by projection 58, thus arresting extension of the stock module. To pass the stop bar, the user presses stop base 52 to one side, allowing tooth 50 to pass. A spring or other biasing means then returns tooth 50 to a central position when pressure is released. A second stop bar, ideally with projection 56 facing a different direction, may be added for further security. In addition, the back of the transverse groove 57 may be fashioned with such a projection to prevent the stock module from accidentally being pulled off the buffer tube module.

Although the present invention has been described with reference to preferred embodiments, numerous modifications and variations can be made and still the result will come within the scope of the invention. Included in these variations would be the use of this latching system in structures besides rifle stocks, as the present invention may be used in any situation wherein relative longitudinal motion, such as described in the preferred embodiment, of two pieces is required. No limitation with respect to the specific embodiments disclosed herein is intended or should be inferred.